



## ABSTRACT SUBMISSION

**Title: Relationship between diffusion tensor imaging (DTI) and magnetic resonance spectroscopic imaging (MRSI) in diffuse intrinsic pontine glioma (DIPG)**

**Abstract No.** 0270

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### Abstract

**Background:** MRSI and DTI are noninvasive techniques used to investigate the characteristics of brain tumors. MRSI evaluates tissue metabolism, typically elevated in active tumors, while DTI reflects tissue microstructure with lower mean diffusivity (MD) observed in regions of higher cellularity, such as high-grade tumor. We explored the relationship between MRSI and DTI in children with DIPG.

**Methods:** Patients with DIPG underwent longitudinal MRI evaluations including MRSI and DTI. Pre-contrast axial fluid attenuated inversion recovery (FLAIR) images were used to co-register MD and MRSI maps. Regions of interest included the entire tumor identified on FLAIR. Voxels with the maximum choline:N-acetylaspartate (Cho:NAA) and minimum MD value were identified, presumably corresponding to areas of highest metabolic activity and highest cellularity, respectively. MRSI and DTI were considered co-localized if max Cho:NAA and minimum MD were from the same or adjacent voxels. The relationship between MRSI and DTI was evaluated using percent co-localization and repeated measures analysis of variance.

**Results:** Thirty patients (median=5.4 yrs, range=1.8-14.1 yrs) were evaluated, with a total of 64 scans. Max Cho:NAA ranged from 0.7 to 7.9 (median=2.0). Minimum MD ranged from 0.8 to 1.4 x 10<sup>-6</sup>mm<sup>2</sup>/s (median=1.0 x 10<sup>-6</sup>mm<sup>2</sup>/s). Co-localization between max Cho:NAA and minimum MD voxels was 53%. Correlation between Max Cho:NAA and minimum MD was not significant (p=0.27).

**Conclusions:** Maximum Cho:NAA and minimum MD values did not co-localize well. Tumor areas with greatest metabolic activity determined by MRSI typically did not correspond to regions of minimum MD determined by DTI. In addition, all minimum MD values were greater than that of normal tissue, indicating a broad influence of edema that may mask areas of increased cellularity. Max Cho:NAA and minimum MD do not seem to provide complementary information about DIPG. Further investigation is needed to understand the relationship of results from these modalities in patients with DIPG.

**Permission** Yes

**Approval** Confirm

**Affiliations**

- (1) Pediatric Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD, USA
- (2) In Vivo NMR Center, National Institutes of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, MD, USA
- (3) Program on Pediatric Imaging and Tissue Sciences, Section on Tissue Biophysics and Biomimetics, National Institute of Child Health and Human Development, National Institutes of Health, Bethesda, MD, USA
- (4) Biostatistics and Data Management Section, National Cancer Institute, National Institutes of Health, Bethesda, MD, USA

**Authors** Emilie Steffen-Smith (1) Presenting  
Joelle Sarlls (2)  
Carlo Pierpaoli (3)  
Lindsay Walker (3)  
David Venzon (4)  
Robyn Bent (1)  
Katherine Warren (1)

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**Alternate contact** warrenk@mail.nih.gov

Contact us if you have a problem or wish to withdraw a submission: [info@ispno2012.com](mailto:info@ispno2012.com)